ARMY RESEARCH LABORATORY

Chemical Biological Material Effects Database
New User Guide

by Peter Holman and Albert W. Price

ARL-TR-5443 **February 2011**

NOTICES

Disclaimers

The findings in this report are not to be construed as an official Department of the Army position unless so designated by other authorized documents.

Citation of manufacturer's or trade names does not constitute an official endorsement or approval of the use thereof.

Destroy this report when it is no longer needed. Do not return it to the originator.

Army Research Laboratory
Aberdeen Proving Ground, MD 21005-5068

ARL-TR-5443 **February 2011**

Chemical Biological Material Effects Database New User Guide

Peter Holman and Albert W. Price
Survivability/Lethality Analysis Directorate, ARL

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188

1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED (From - To)
February 2011	Final	October 2009–July 2010

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Chemical Biological Material Effects Database New User Guide	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)	5d. PROJECT NUMBER
Peter Holman and Albert W. Price	1LB5A1
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	8. PERFORMING ORGANIZATION REPORT NUMBER
U.S. Army Research Laboratory ATTN: RDRL-SLB-A Aberdeen Proving Ground, MD 21005-5068	ARL-TR-5443

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT

Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES

14. ABSTRACT

The Chemical Biological Material Effects (CBME) database has been developed to help designers and developers with the task of incorporating nuclear, biological, and chemical contamination survivability into system design and development. The database system contains test data from technical reports on over 550 materials that have been exposed to chemical warfare agents. The database details the effects of these agents and decontaminants on specific properties of materials.

The purpose of this guide is to inform new users about the functions of the CBME database so that they can find available data quickly and efficiently and obtain maximum benefit from its content.

15. SUBJECT TERMS

chemical biological effect database, user guide

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Peter Holman
Unclassified	Unclassified	Unclassified	UU	24	19b. TELEPHONE NUMBER (*Include area code*) 410-278-5085

Standard Form 298 (Rev. 8/98)
Prescribed by ANSI Std. Z39.18

Contents

List of Figures

1. Purpose

The purpose of this guide is to inform new users about the functions of the Chemical Biological Material Effects (CBME) database so that they can find available data quickly and efficiently and obtain maximum benefit from its content.

This guide covers the following:

- Creating a new CBME user account
- Navigating the database
- Searching and browsing material effects data
- Downloading source documents
- Exporting results into a spreadsheet format
- Material testing nomination process

2. Getting Started

2.1 Logging In

From the Login Page, shown in figure 1, the user can either log in to the database or create a new user account. The database URL is https://cbme.cbrniac.apgea.army.mil/Login.aspx.

The “Contact Us” link allows the user to offer comments about the database. It can also be used to contact the system administrators if the user is experiencing problems creating an account or logging in to the database.

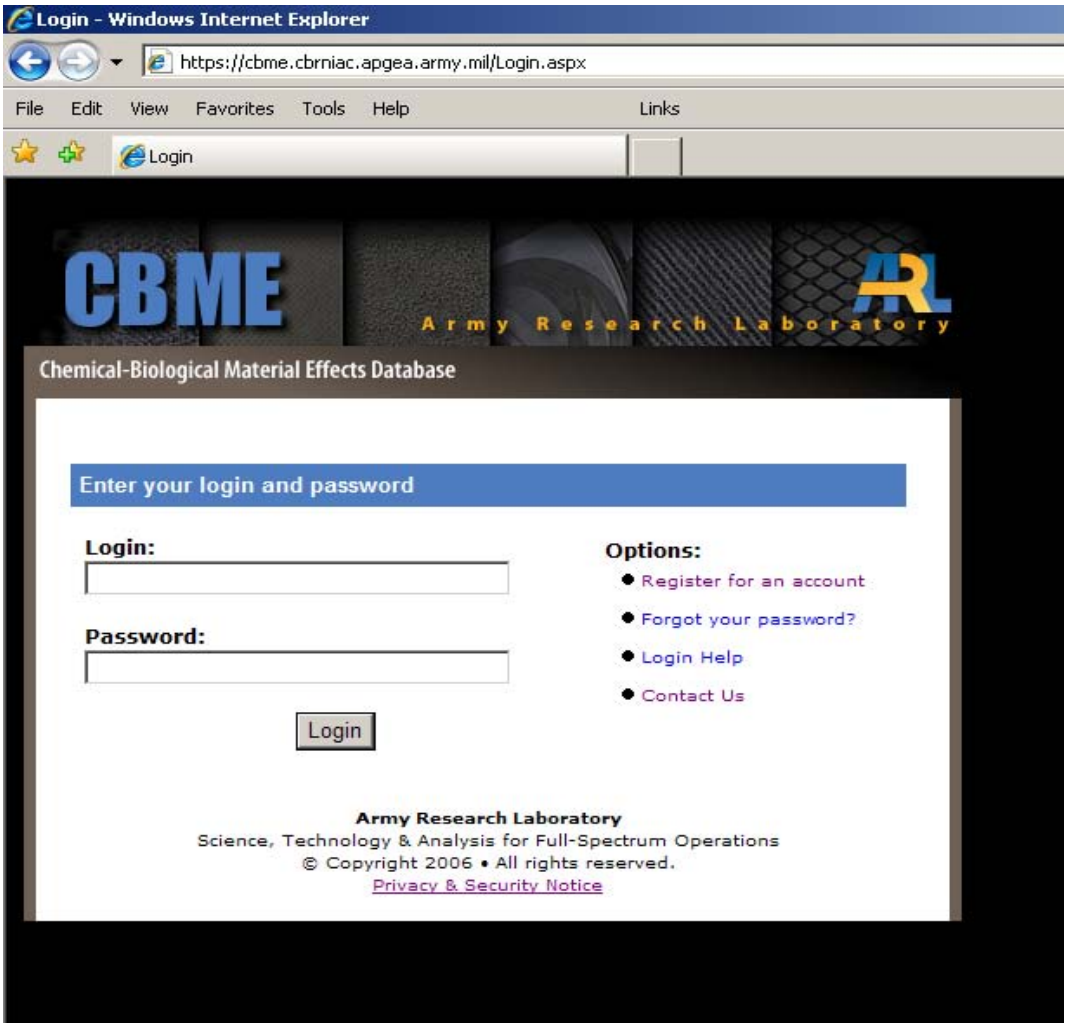


Figure 1. CBME Login Page.

2.2 Metrics

Figures 2 and 3 show the CBME Home Page that is shown after logging in to the database. The What's New on CBME section explains the most recent updates to the database. "CBME Metrics" shows the current number of different materials, challenges, and test entries contained in the database.

2.3 Available Documents

After scrolling down to the bottom of the page on the CBME Home Page, one can find a listing of reference documents available for download. Currently available documents include the following:

- CBME Tri-Fold Pamphlet – a concise overview of the database.
- Material Effects Test Operating Procedure (TOP) – this TOP is developed specifically for testing the physical properties of materials commonly assessed.

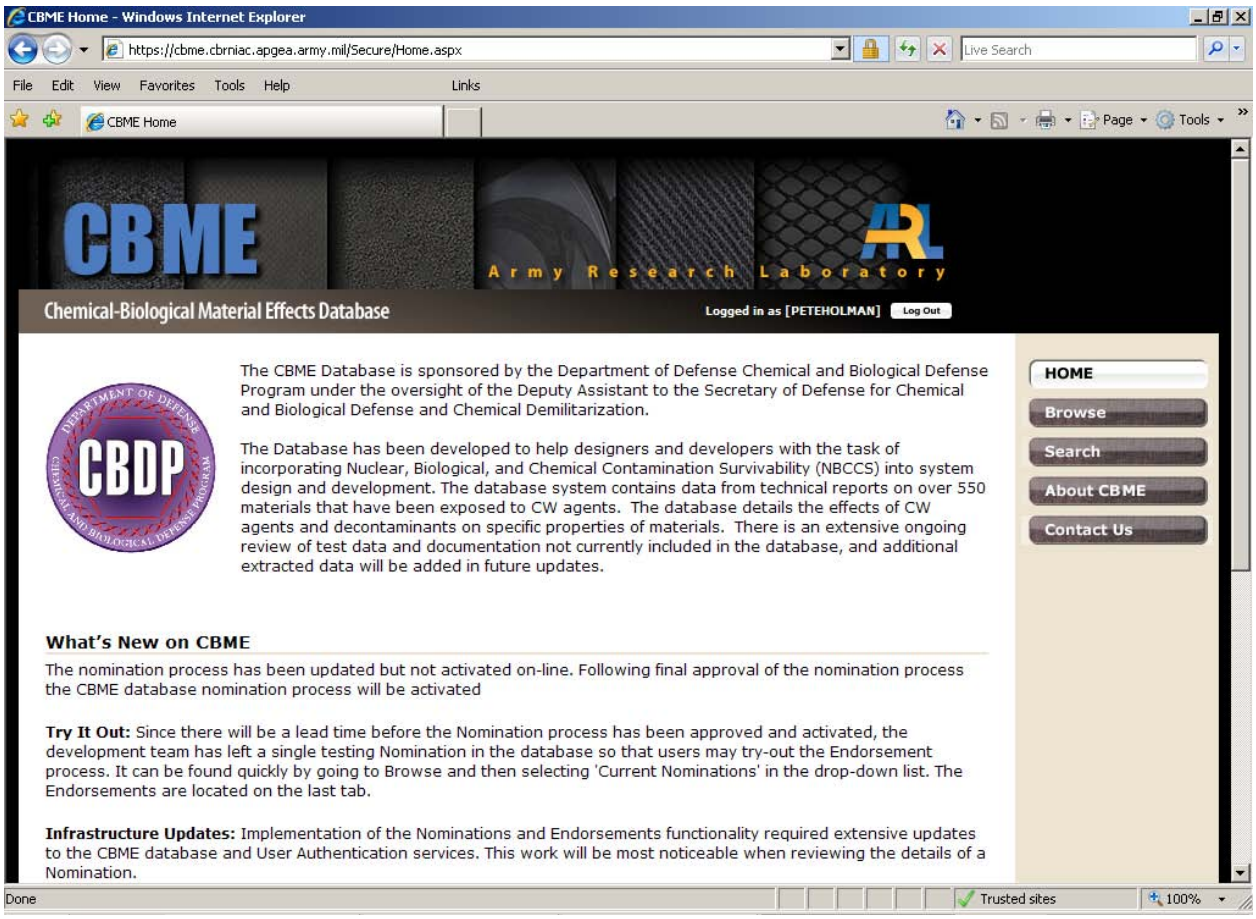


Figure 2. CBME Home Page.

- CBME Test Data Capture Template – an Excel spreadsheet that a tester may use to report test data in a format which can easily and efficiently be extracted and uploaded into the CBME.
- U.S. Department of Defense Military Handbook 784 – reference material on the guidelines and design to mimimize contamination and facilitate decontamination of military vehicles and other equipment interiors and exteriors.
- Multiservice Chemical, Biological, Radiological, and Nuclear (CBRN) Decontamination Manual – reference material on tactics, techniques, and procedures for CBRN decontamination.

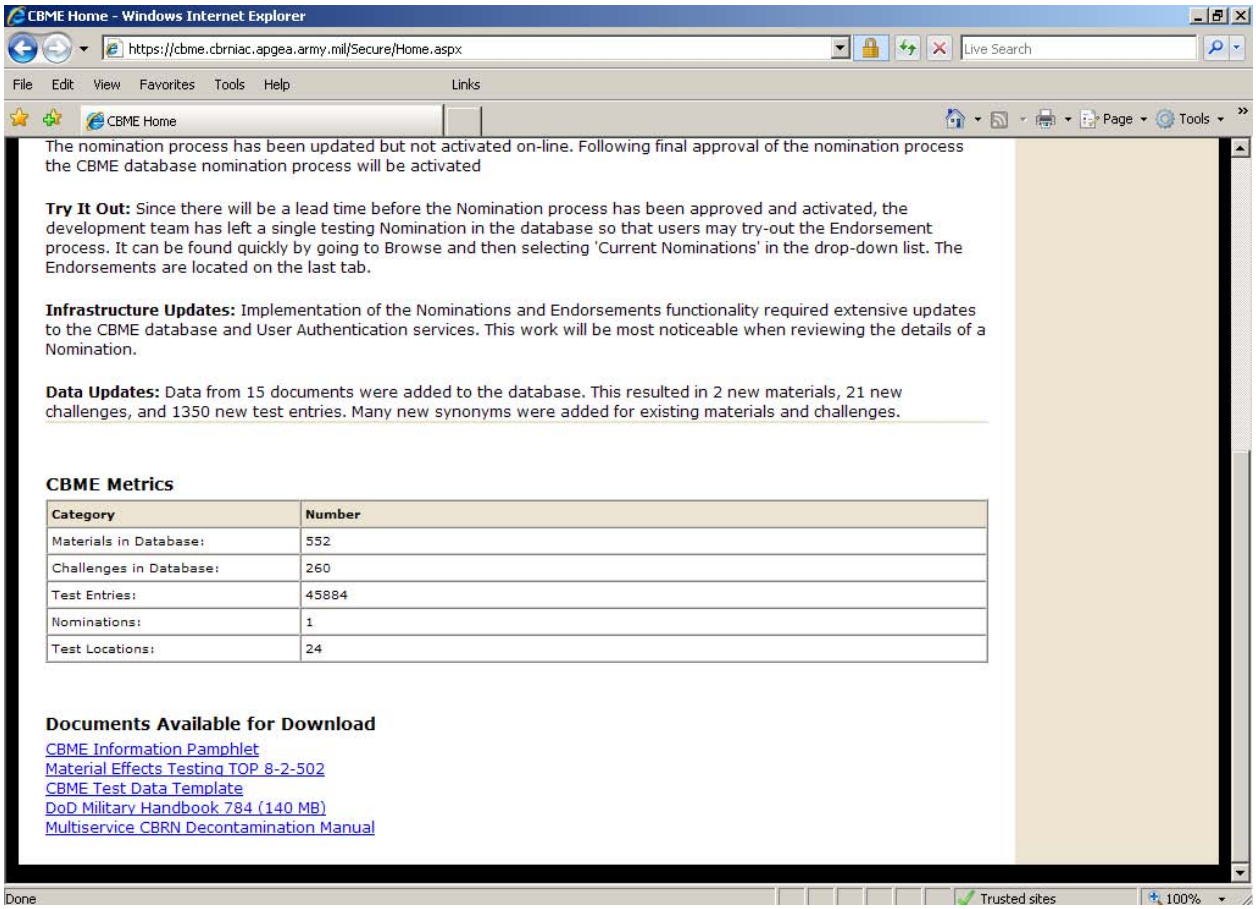


Figure 3. CBME Home Page – metrics and available documents.

3. CBME Database Features

On the right side of the CBME Home Page screen, there are the five following control panel buttons:

1. HOME – takes the user back to this screen.
2. BROWSE – enables the user to quickly look through the contents of the database.
3. SEARCH – permits the user to conduct inquiries for specific materials and challenges.
4. ABOUT CBME – information about why the database was created; also includes a list of all the updates to the database since it was created.
5. CONTACT US – same as on the Login Page; allows the user to comment, ask questions, or report any problems encountered while using the database.

3.1 Browse Function

The browse feature lets the user quickly look through the contents of the database. First, a selection must be made in the "Browse By" drop-down list. The choices are to browse by either Materials, Challenges, Source Documents, Test Locations, or Current Nominations.

Figure 4 shows browsing by materials. There are then several material categories to choose from: metals, laminates, adhesives, coatings, elastomers, etc. The category of metals is selected and shown. The subcategory of nonferrous metals and alloys is selected next. Finally, aluminum alloy is selected. A listing of all the different aluminum alloys in the database is also shown. The blue icon next to the entry "A03560" indicates data for this material exists in the CBME database. A brown icon would indicate that this material has been nominated for testing.

The other options available from the Browse By drop-down menu are as follows:

- Challenges – this is similar to the previous materials example but for chemical and biological test agents, decontaminants, and simulants.
- Source Documents – this shows a listing of over 1000 source documents for material effects test data; many are available for review and download.
- Test Locations – this is a listing of several facilities that are able to perform material effects testing.
- Current Nominations – this is a listing of all of the CBME nominations for new material effects testing.

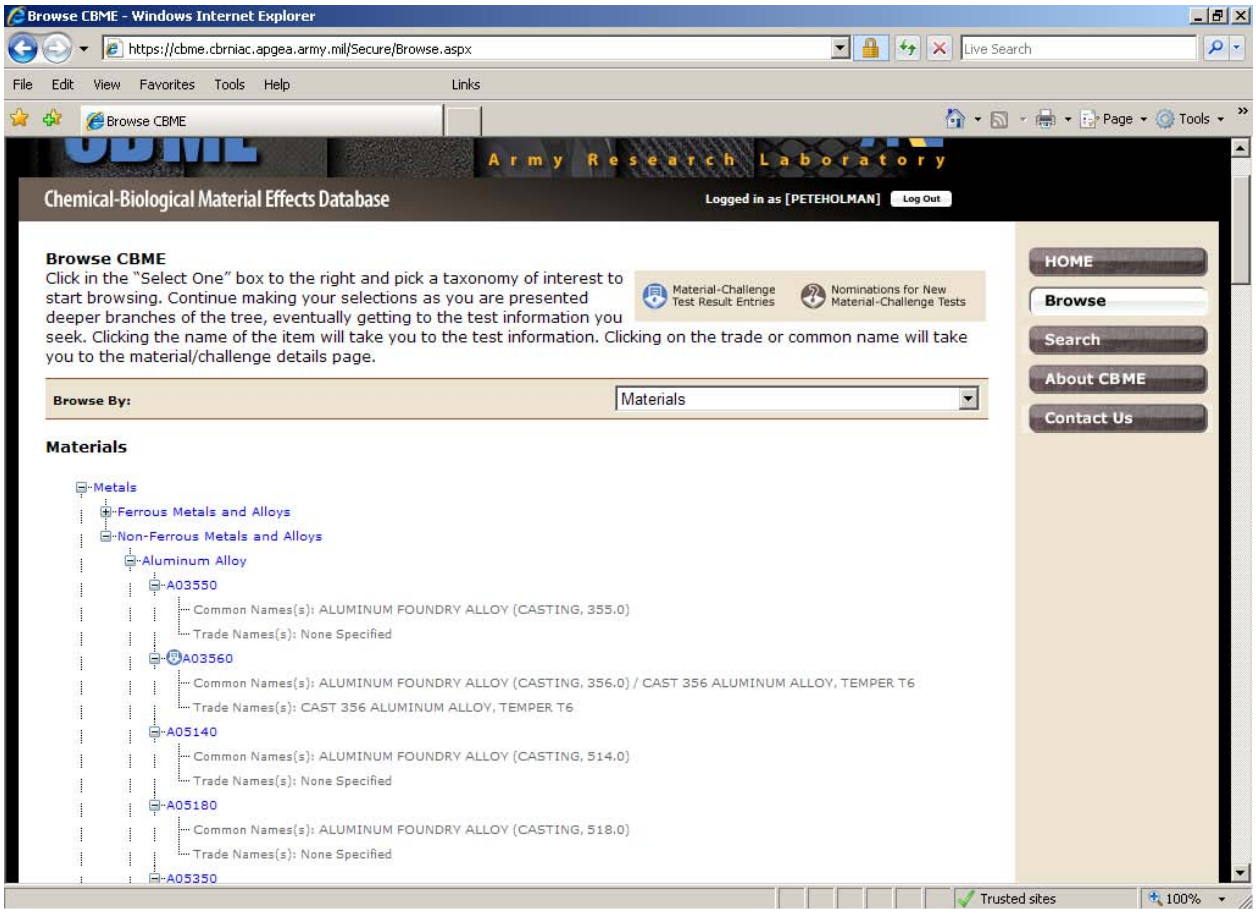


Figure 4. Browse function display.

Figure 5 is the view after a specific material or challenge is selected using the browse funtion. In this case, it is a listing of all test entries on the material A03560, an aluminum alloy.

Clicking on "View Details" for one of the entries will bring up specific details about that test, showing test conditions and material information, as shown in figure 6. The source document for this data may be viewed online or it may be downloaded as a PDF file.

The Test Details section includes six tabs with information about how the test was performed and the results of the test. Each tab contains several data entries. These tabs are organized as follows:

- Test Description – information about how the test was performed.
- Test Data – the results of the test.
- Material – information about the material that was tested.
- Challenge – chemical/biological agent(s) and/or decontaminants used in the test.

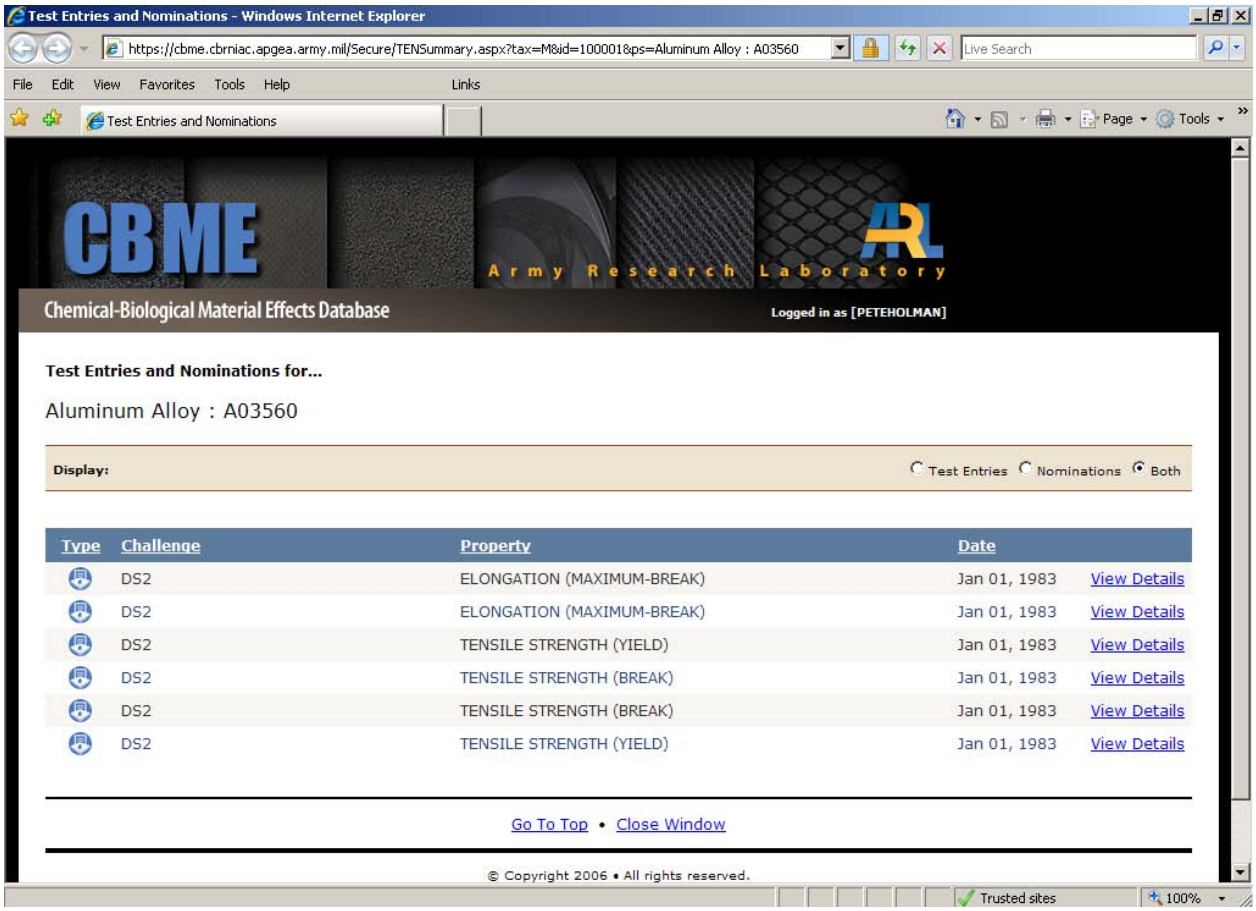


Figure 5. Results from browse.

- Property – material property that was tested.
- Source – information about the source document and a link to download the document.

Note that many of the information fields in these tabs may be empty. Completeness of these fields depends on the amount of data available in the source document.

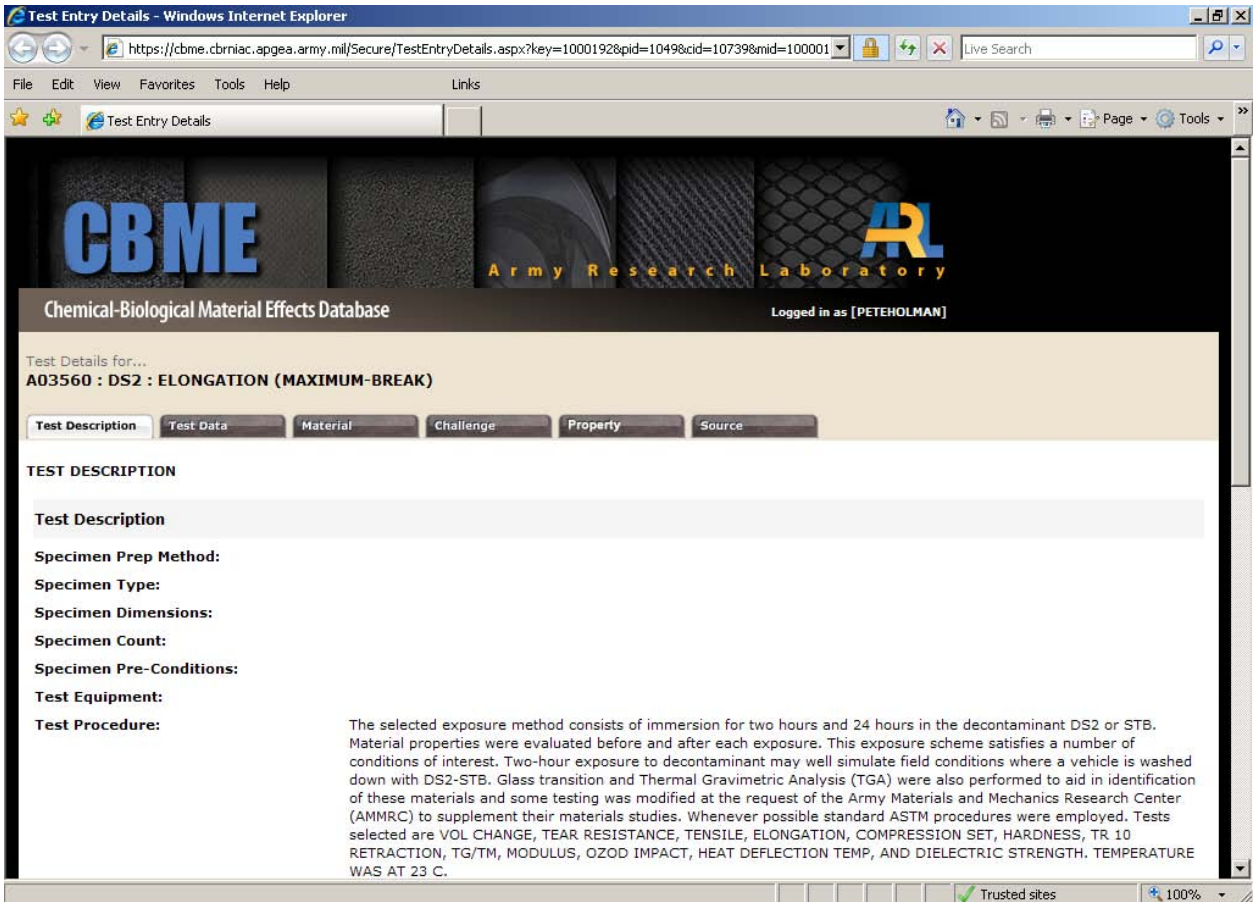


Figure 6. Browse - view details.

3.2 Search Function

3.2.1 Quick Search

Clicking the "Search" button on the control panel on the right side of the screen brings up the Quick Search function, as shown in figure 7. Here, the user can select which areas of the database to search. The options include Test Entries and Nominations, Synonyms, Source Documents, and Test Locations.

When the lower Search button is clicked, the screen is refreshed, and a "Results Summary" appears that shows how many entries there are for each box that was selected. "View" can then be clicked to proceed to the Results page. If a large number of test entries exist for your search, a message will appear asking you to consider narrowing your search.

To perform a more complex search, click on the "Advanced Search" link.

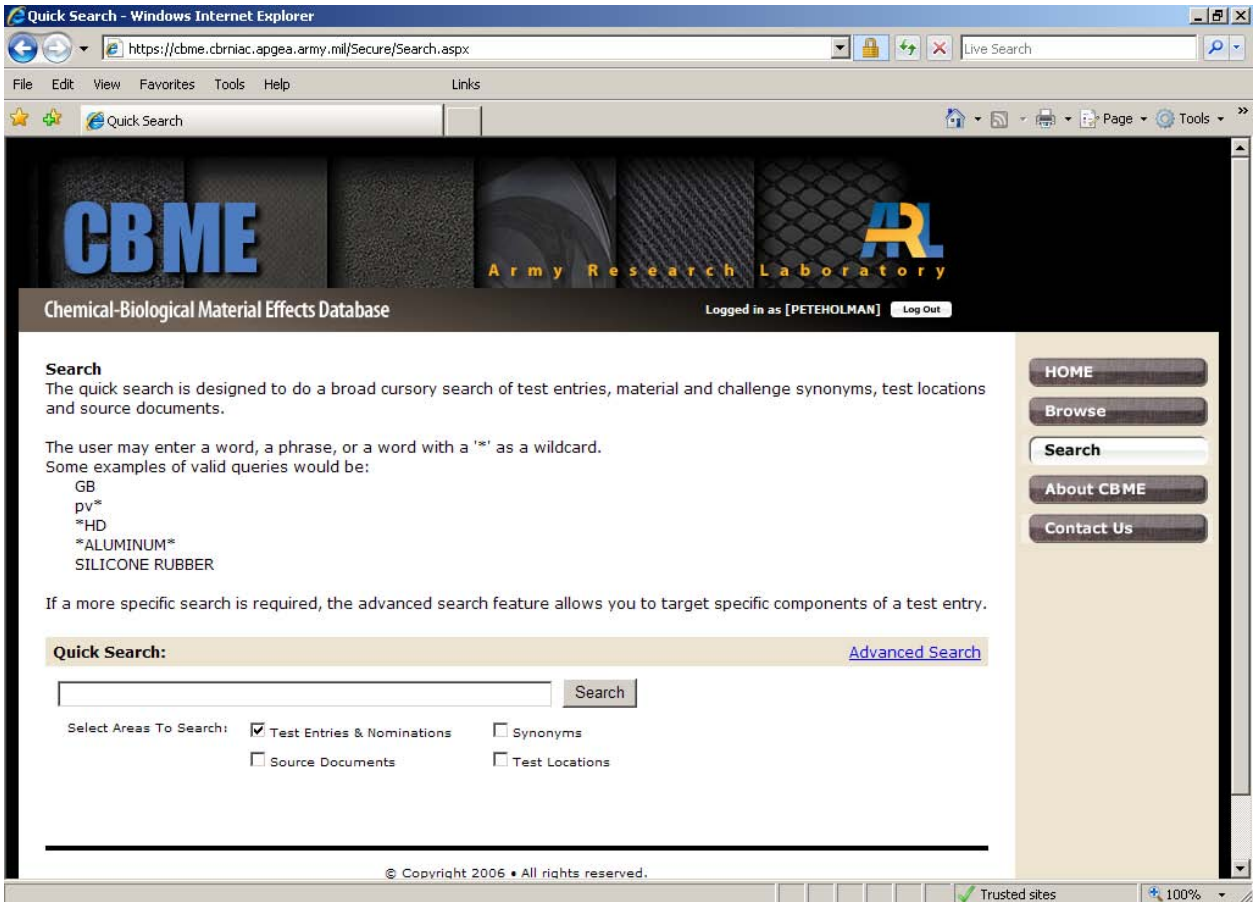


Figure 7. Search using quick search.

3.2.2 Advanced Search

The Advanced Search link allows users to create queries for combinations of specific materials, challenges, and properties. Clicking on the drop-down menu allows the user to select either material, challenge, property, or CBIAC number. The "and," "or," and "none" buttons allow the user to have more control over their search. More detailed instructions appear at the top of the Advanced Search page.

The results in figure 8 show that there are 563 entries on the material PVC, 3890 entries that include the challenge GD, and 67 entries that contain both PVC and GD. Using the "Preview" button instead of the Search button shows how many entries exist before bringing up the results by clicking on "View."

Clicking on "Legal Values" will bring up a complete database listing of all the different materials, properties, or challenges. These are sorted by Material Type, Category, and Sub-Category. When Legal Values is clicked while the CBIAC number is selected from the drop-down box, a window opens that shows the title and CBIAC number for each document in the database. Documents that have test entries available are annotated with "*."

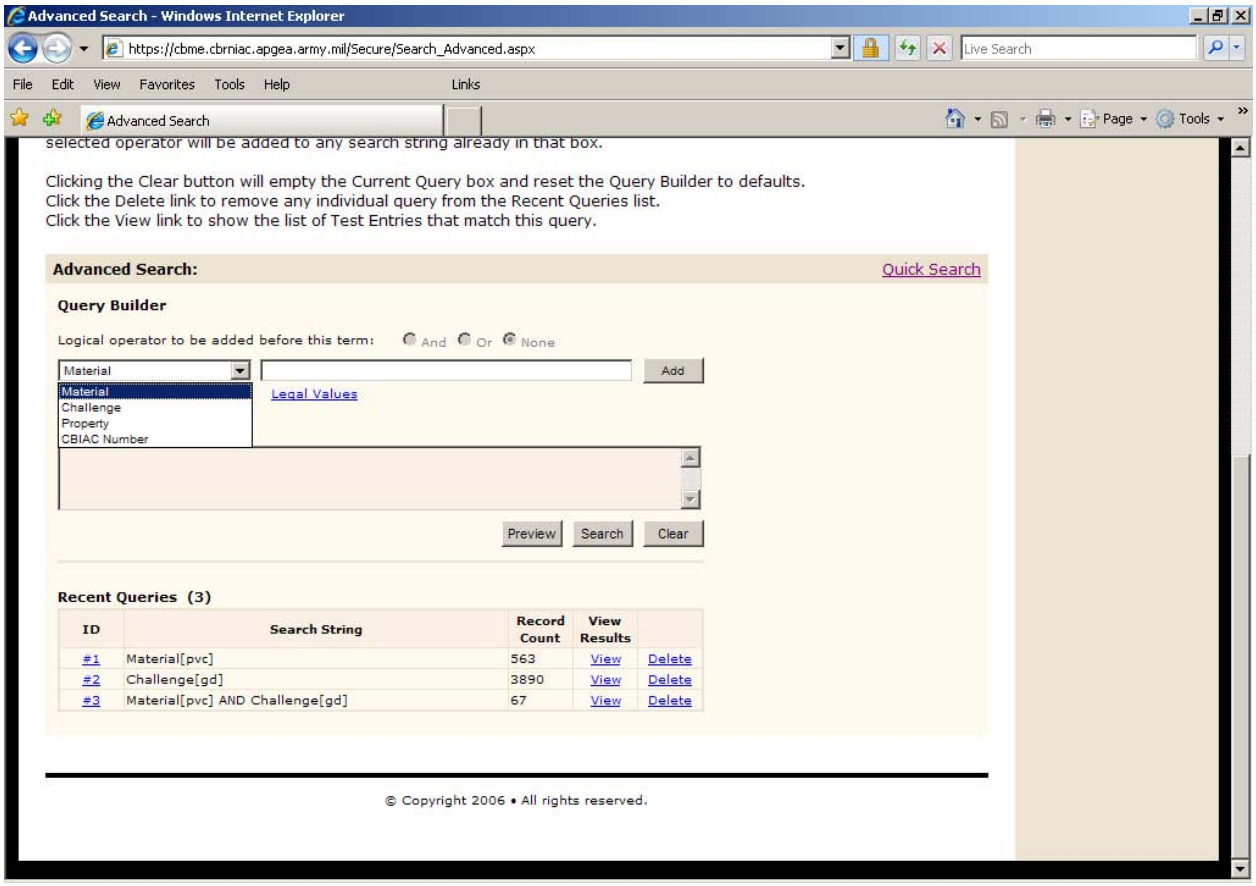


Figure 8. Search using advanced search.

4. Search/Browse Results

4.1 Viewing Results

Figure 9 displays the Results page for Search and Advanced Search.

By default, the columns presented are as follows:

- Type – a blue icon indicates this entry has test data; a brown icon indicates that this material has been nominated for new testing.
- Material – the material that was tested.
- Challenge – the chemical agents/decontaminants/simulants used for this test.
- Property – the material property that was tested.

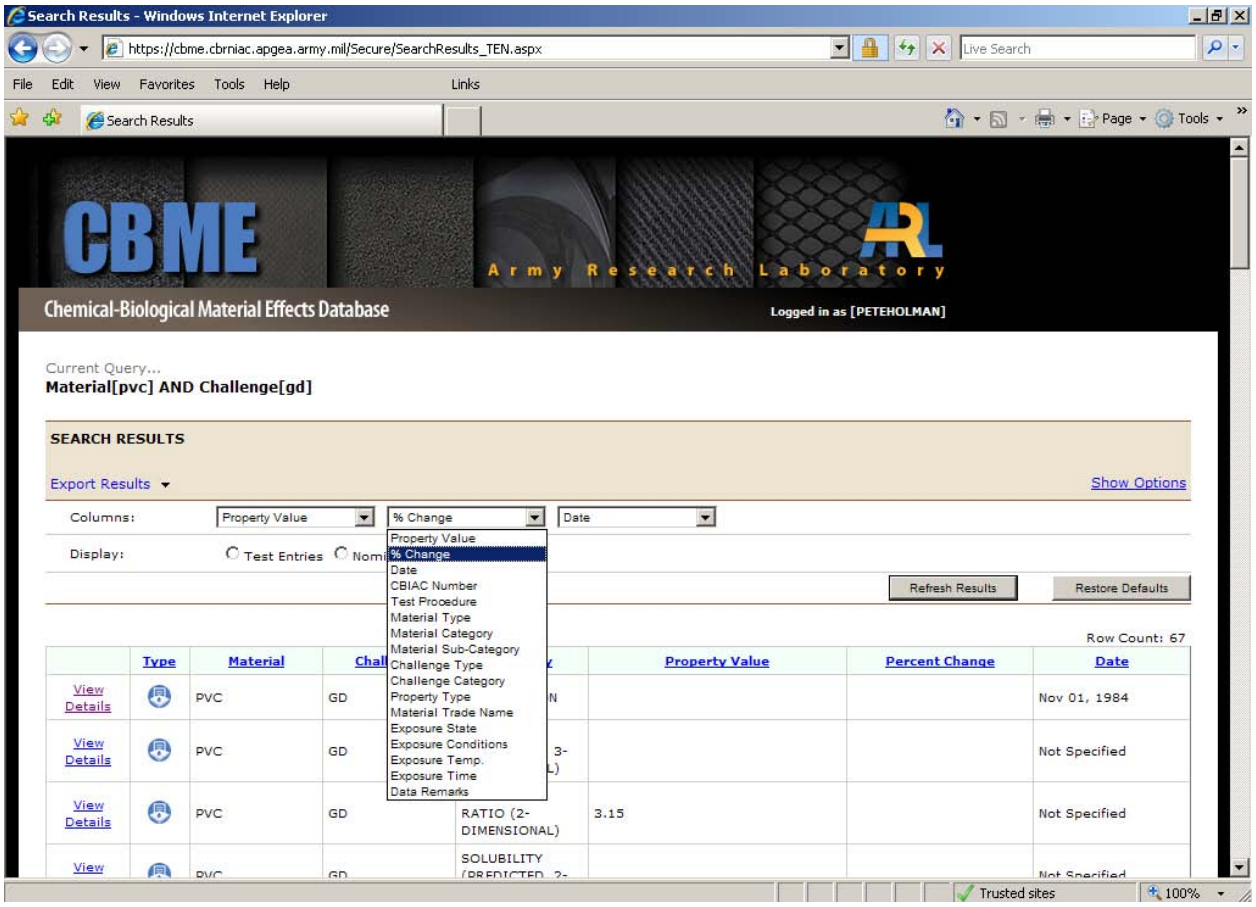


Figure 9. Search results.

- Property Value – value of the tested property.
- Percent Change – percent change in value compared to pretest conditions.
- Date – date that the source document was published.

Of these columns, the three on the right are able to be changed. On the top right of the screen, there is a "Show Options" button that will allow different columns to be displayed. There are 14 additional columns that can be viewed; they are shown in the drop-down menu of figure 9. Clicking on the column heading for any column will sort the results based on the values in that column.

The "Export Results" option on the top left of this screen will allow the data to be exported into an Excel spreadsheet.

When "View Details" is clicked on one of the search results, the window shown in figure 10 opens up. The information displayed is the same as when View Details is clicked from the Browse function, which was previously described.

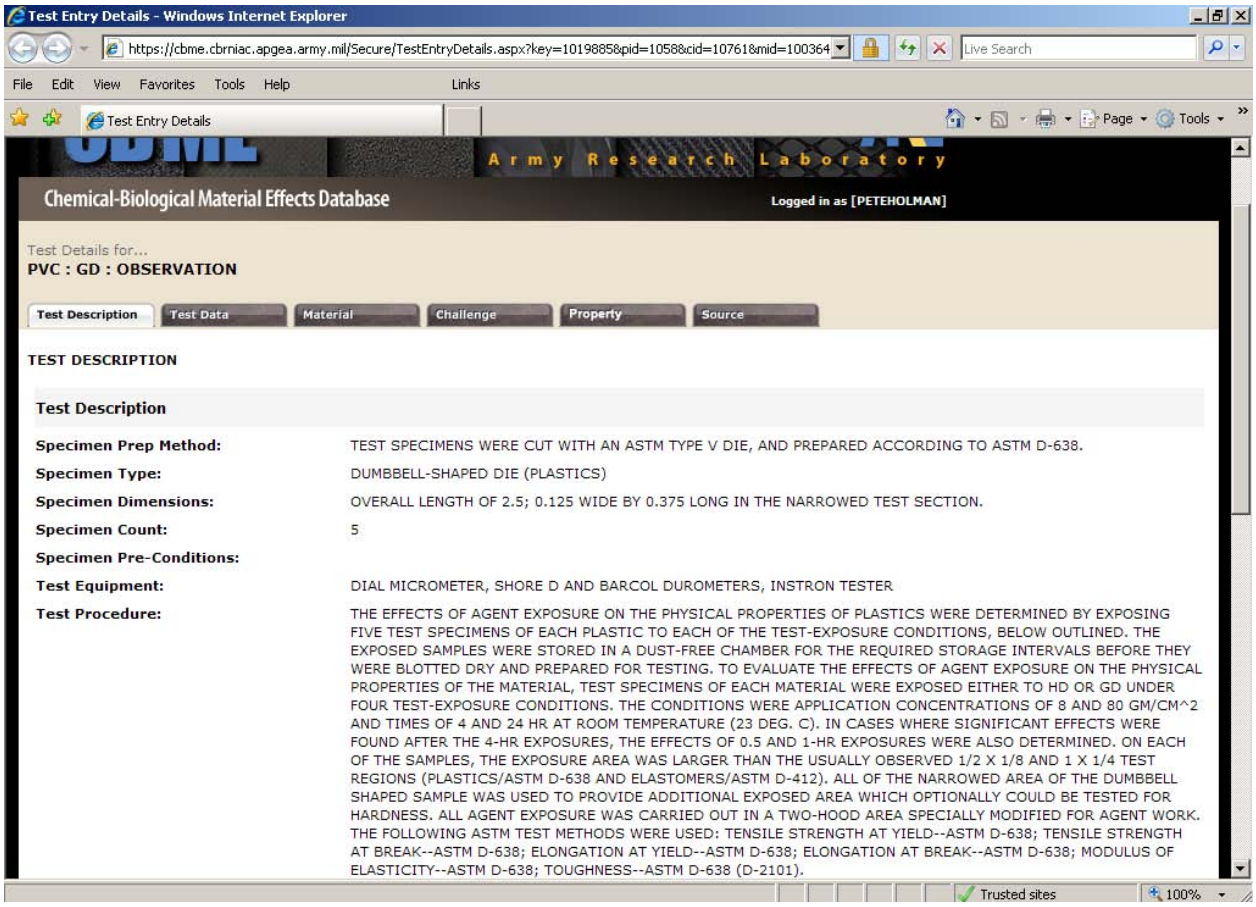


Figure 10. Search results - view details.

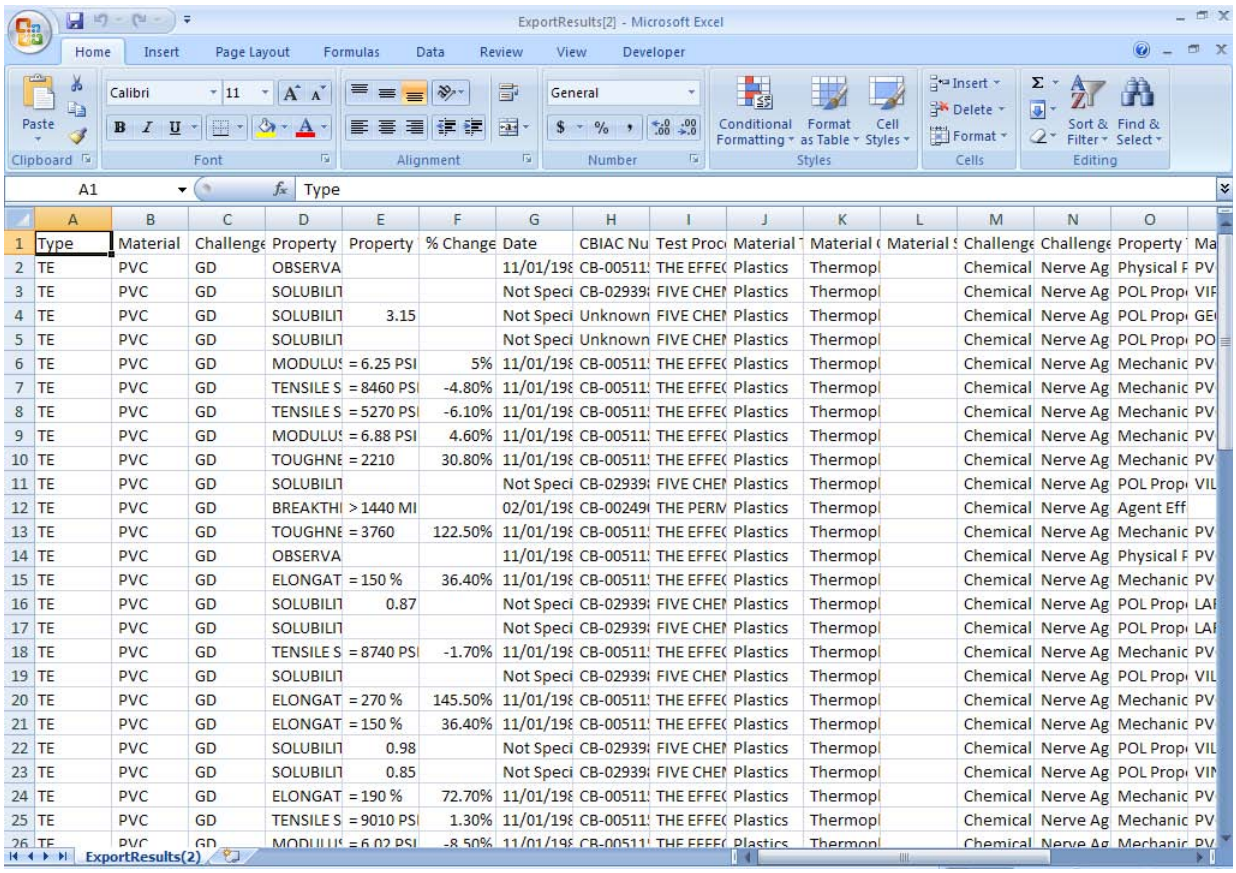
To return to the Search page when viewing the List of Results, use the “Back” button located at the bottom of the Results page. If the Web browser Back button is used, you will need to refresh the page before it will appear.

4.2 Exporting Results

As mentioned previously, on the top left of the Search Results page (figure 9) is an “Export Results” option. Moving the mouse over Export Results brings up two options for exporting this data.

“Currently Displayed Columns” will take all of the columns that are currently displayed and export them into a .CSV file which can be opened with Microsoft Excel, illustrated in figure 11.

“Full Summary” will export all available columns for each entry in your search results. This feature permits an extra 14 columns in addition to what is exported with the Currently Displayed function.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Type	Material	Challenge	Property	Property	% Change	Date	CBIAC Nu	Test Proc	Material	Material	Material	Challenge	Challenge	Property
2	TE	PVC	GD	OBSERVA			11/01/19	CB-00511	THE EFFE	Plastics	Thermopl		Chemical	Nerve Ag	Physical F
3	TE	PVC	GD	SOLUBILI			Not Speci	CB-02939	FIVE CHE	Plastics	Thermopl		Chemical	Nerve Ag	POL Prop
4	TE	PVC	GD	SOLUBILI	3.15		Not Speci	Unknown	FIVE CHE	Plastics	Thermopl		Chemical	Nerve Ag	POL Prop
5	TE	PVC	GD	SOLUBILI			Not Speci	Unknown	FIVE CHE	Plastics	Thermopl		Chemical	Nerve Ag	POL Prop
6	TE	PVC	GD	MODULUS	= 6.25 PSI	5%	11/01/19	CB-00511	THE EFFE	Plastics	Thermopl		Chemical	Nerve Ag	Mechanic
7	TE	PVC	GD	TENSILE S	= 8460 PSI	-4.80%	11/01/19	CB-00511	THE EFFE	Plastics	Thermopl		Chemical	Nerve Ag	Mechanic
8	TE	PVC	GD	TENSILE S	= 5270 PSI	-6.10%	11/01/19	CB-00511	THE EFFE	Plastics	Thermopl		Chemical	Nerve Ag	Mechanic
9	TE	PVC	GD	MODULUS	= 6.88 PSI	4.60%	11/01/19	CB-00511	THE EFFE	Plastics	Thermopl		Chemical	Nerve Ag	Mechanic
10	TE	PVC	GD	TOUGHNE	= 2210	30.80%	11/01/19	CB-00511	THE EFFE	Plastics	Thermopl		Chemical	Nerve Ag	Mechanic
11	TE	PVC	GD	SOLUBILI			Not Speci	CB-02939	FIVE CHE	Plastics	Thermopl		Chemical	Nerve Ag	POL Prop
12	TE	PVC	GD	BREAKTH	> 1440 MI		02/01/19	CB-00249	THE PERM	Plastics	Thermopl		Chemical	Nerve Ag	Agent Eff
13	TE	PVC	GD	TOUGHNE	= 3760	122.50%	11/01/19	CB-00511	THE EFFE	Plastics	Thermopl		Chemical	Nerve Ag	Mechanic
14	TE	PVC	GD	OBSERVA			11/01/19	CB-00511	THE EFFE	Plastics	Thermopl		Chemical	Nerve Ag	Physical F
15	TE	PVC	GD	ELONGAT	= 150 %	36.40%	11/01/19	CB-00511	THE EFFE	Plastics	Thermopl		Chemical	Nerve Ag	Mechanic
16	TE	PVC	GD	SOLUBILI	0.87		Not Speci	CB-02939	FIVE CHE	Plastics	Thermopl		Chemical	Nerve Ag	POL Prop
17	TE	PVC	GD	SOLUBILI			Not Speci	CB-02939	FIVE CHE	Plastics	Thermopl		Chemical	Nerve Ag	POL Prop
18	TE	PVC	GD	TENSILE S	= 8740 PSI	-1.70%	11/01/19	CB-00511	THE EFFE	Plastics	Thermopl		Chemical	Nerve Ag	Mechanic
19	TE	PVC	GD	SOLUBILI			Not Speci	CB-02939	FIVE CHE	Plastics	Thermopl		Chemical	Nerve Ag	POL Prop
20	TE	PVC	GD	ELONGAT	= 270 %	145.50%	11/01/19	CB-00511	THE EFFE	Plastics	Thermopl		Chemical	Nerve Ag	Mechanic
21	TE	PVC	GD	ELONGAT	= 150 %	36.40%	11/01/19	CB-00511	THE EFFE	Plastics	Thermopl		Chemical	Nerve Ag	Mechanic
22	TE	PVC	GD	SOLUBILI	0.98		Not Speci	CB-02939	FIVE CHE	Plastics	Thermopl		Chemical	Nerve Ag	POL Prop
23	TE	PVC	GD	SOLUBILI	0.85		Not Speci	CB-02939	FIVE CHE	Plastics	Thermopl		Chemical	Nerve Ag	POL Prop
24	TE	PVC	GD	ELONGAT	= 190 %	72.70%	11/01/19	CB-00511	THE EFFE	Plastics	Thermopl		Chemical	Nerve Ag	Mechanic
25	TE	PVC	GD	TENSILE S	= 9010 PSI	1.30%	11/01/19	CB-00511	THE EFFE	Plastics	Thermopl		Chemical	Nerve Ag	Mechanic
26	TE	PVC	GD	MODULUS	= 6.02 PSI	-8.50%	11/01/19	CB-00511	THE EFFE	Plastics	Thermopl		Chemical	Nerve Ag	Mechanic

Figure 11. Export results.

5. Material Effects Testing Nominations and Endorsements

Users are able to nominate materials for material effects testing that have insufficient data available in the CBME. There is a process where the nominations are scored against each other in accordance with established criteria, and high scoring nominations may be funded for testing. To begin the nomination process, a form needs to be filled out that will be available from the Home Page of the CBME.

Once the nomination process is activated, users will have the opportunity to make endorsements to existing nominations that others have submitted. Once activated, users can also view current nominations and make endorsements by clicking the "Browse" button from the Home Page. From the drop-down menu, select "Current Nominations." A listing of current nominations will be displayed.

Glossary

CBIAC Number	Chemical Biological Information Analysis Center document reference number is assigned by the CBRNIAC to every document accessible to the CBME database
CBRNIAC	Chemical, Biological, Radiological, and Nuclear Information Analysis Center
Challenge	Chemical warfare agents, biological warfare agents, simulants, or decontaminants used to test changes in material properties
Material	A sample coupon or item that is tested
Property	A physical/electrical characteristic of a material measured before and after being exposed to a challenge
Test Entry	Reported property test result of one challenge to one material

NOTE: Comments and recommendations to help improve this user guide are welcome.
Send to: CBME@arl.army.mil.

NO. OF
COPIES ORGANIZATION

1 (PDF only) DEFENSE TECHNICAL INFORMATION CTR
DTIC OCA
8725 JOHN J KINGMAN RD
STE 0944
FORT BELVOIR VA 22060-6218

1 DIRECTOR
US ARMY RESEARCH LAB
IMNE ALC HRR
2800 POWDER MILL RD
ADELPHI MD 20783-1197

1 DIRECTOR
US ARMY RESEARCH LAB
RDRL CIM L
2800 POWDER MILL RD
ADELPHI MD 20783-1197

1 DIRECTOR
US ARMY RESEARCH LAB
RDRL CIM P
2800 POWDER MILL RD
ADELPHI MD 20783-1197

1 DIRECTOR
US ARMY RESEARCH LAB
RDRL D
2800 POWDER MILL RD
ADELPHI MD 20783-1197

ABERDEEN PROVING GROUND

1 DIR USARL
RDRL CIM G (BLDG 4600)

NO. OF COPIES ORGANIZATION

1 (CD only) ASST SECY ARMY
ACQSTN LOGISTICS & TECH
SAAL ZS RM 3E448
103 ARMY PENTAGON
WASHINGTON DC 20310-0103

1 (CD only) DIRECTOR FORCE DEV
DAPR FDZ
RM 3A522
460 ARMY PENTAGON
WASHINGTON DC 20310-0460

1 US ARMY TRADOC ANL CTR
ATRC W
A KEINTZ
WSMR NM 88002-5502

1 USARL
RDRL SLE
R FLORES
WSMR NM 88002-5513

ABERDEEN PROVING GROUND

1 US ARMY DEV TEST COM
CSTE DTC TT T
314 LONGS CORNER RD
APG MD 21005-5055

1 US ARMY EVALUATION CTR
TEAE SV
P A THOMPSON
4120 SUSQUEHANNA AVE
APG MD 21005-3013

12 DIR USARL
RDRL SL
J BEILFUSS
J FEENEY
J FRANZ
M STARKS
P TANENBAUM
RDRL SLB A
R DIBELKA
G MANNIX
RDRL SLB D
R GROTE
RDRL SLB E
M PERRY
RDRL SLB G
P MERGLER

NO. OF COPIES ORGANIZATION

RDRL SLB S
S SNEAD
RDRL SLB W
L ROACH

NO. OF
COPIES ORGANIZATION

ABERDEEN PROVING GROUND

1 (PDF only) DIRECTOR
US ARMY RESEARCH LAB
RDRL SLB A
APG MD 21005-5068

2 JOINT CBRN DEFNS PRGM ANLYS
AND INTEGRATION OFC
DAPR FDB PAI
H MEARNS
K ODELL
5183 BLACKHAWK RD
APG MD 21010-5424

7 DIR USARL
RDRL SLB A
D CARABETTA
C HILL
P HOLMAN (4 CPS)
A PRICE

INTENTIONALLY LEFT BLANK.